



CHANGING THE ERA OF IMPLANT DENTISTRY USING A WONDER TOOL: ELECTRICAL MAGNETIC Mallet

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ABSTRACT

Implant dentistry has become a revolutionary branch nowadays. The use of magnetic mallet has provided us with some clinical advantages during the surgical procedure over the traditional method of osteotomy using hand mallet and chisel. The present clinical report stated the procedure of surgical placement of an implant in the mandible using an innovative device known as Electrical Magnetic Mallet with great precision.

INTRODUCTION

The alveolar ridges reduce in horizontal dimension after the tooth is lost.¹ Conventional method of restoring the missing tooth with an implant is drilling technique or making use of hand mallet and chisel in osteotomy procedures. Existing literature reports the incidence of Benign paroxysmal positional vertigo (BPPV) with the use of hand mallet while placing dental implants in the maxilla.² Osteonecrosis has also been reported at the implant sites which were placed using drills. Limitations to these procedures led to the introduction of a novel approach which makes use of piezoelectric frequency. The Electrical Magnetic Mallet (Meta-Ergonomica, Turbigo, Milan, Italy), is a dynamic device consisting of a hand piece and a power unit that defines the force to be applied and the timing of application. Power unit implies magnetic wave to the osteotome connected with the hand-piece which results in the longitudinal movements along the central axis of the osteotome.³ The present case report demonstrates restoration of the partially edentulous ridge with dental implants using Electrical Magnetic Mallet.

CASE REPORT:

A 57 year old female was referred to the Department of Conservative Dentistry and Endodontics, Babu Banarasi Das College of Dental Sciences, Lucknow, with the chief complaint of long span partially edentulous area. As the patient was not willing for a removable prosthesis and since the long span did not favour either conventional or adhesive bridgework, dental implant with prosthesis was advised. Past medical and dental history was recorded which reveals good general health, non-smoker and absence of any chronic systemic diseases.

Pre-operative examination was done which revealed presence of D3 bone in left mandibular posterior region i.e. 36 and size of implant was decided accordingly (Fig.1). Bone height and width were measured as 12mm × 5mm in the molar region. Implant was planned to place in the lower left posterior region (extraction done 7 years back).



Fig 1: Pre-operative OPG

Patient was given 1 g of amoxicillin orally one hour prior to surgery. Patient was asked to rinse her mouth twice with Peridex (Chlorhexidine Gluconate 0.12% Oral Rinse). Local anaesthesia administered Xylocaine (20 mg/mL with adrenaline 1:80,000). Two Nerve blocks were given: inferior alveolar nerve block and

long buccal nerve block. Incision was given at the implant site using SM64 blade (Swann Mortan) held by blade holder of magnetic mallet [fig.2 (b)]. The implant site was prepared with osteotomes at frequency 30KHz, sizes 1 and 2, pressed by electrical mallet (Magnetic Mallet, Meta-Ergonomica, Turbigo, Milan, Italy) [fig.2(a)]. One implant was placed successfully. Periapical radiographs were obtained for evaluation before and after implant placement [fig.2(c,d)].

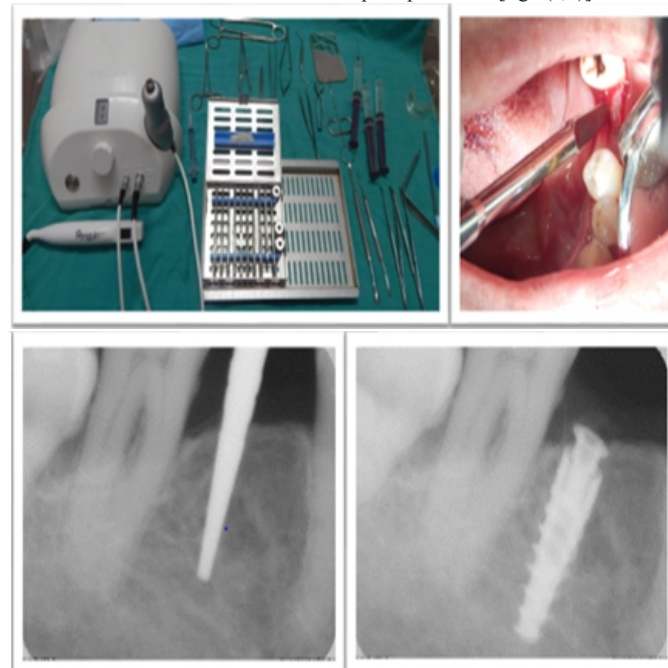


Fig 2: (a) Magnetic Mallet with instruments; (b) Using Electrical osteotome; (c) Peri-apical radiograph showing placement of osteotome; (d) Peri-apical radiograph showing Implant.

DISCUSSION:

Success of implant placement is highly dependent on the density of bone. Literature reviewed implants in dense bone gave better results and far good prognosis than the soft bone.⁴ According to Misch⁵, there are four types of bone in term of its densities.

Volume and quality of the surrounding bone are two major parameters for the success of dental implants to a great extent. Bone density depends (minimal to severe, A- E) on residual jaw shape and different rates of bone resorption following tooth extraction (Ribeiro-Rotta et al., 2010). The atrophy of the alveolar ridge at different rates results in characteristic jaw shapes and density, due to which

obtaining anchorage for dental implants becomes a difficult task. Sufficient bone density and volume are therefore crucial factors for ensuring implant success (Lekholm & Zarb, 1985). The trabeculae in D3 are approximately 50% weaker than those in D2 bone. D3 bone is most often found in the anterior maxilla and posterior regions of either arch. The D3 anterior maxilla is usually of less width than its mandibular D3 counterpart. The D3 bone is not only 50% weaker than D2 bone, the bone-implant contact is also less favourable in D3 bone.⁴

In case of soft bone or resorbed ridges, it is mandatory to preserve the existing bone. Osteotomes used for implant placement has a beneficiary act in compressing & manipulating the bone. Also, osteotome technique do not generate heat, which is a major determinant for osteo-integration. Advantageous use of magnetic mallet on the trabecular bone with the series of gradual increasing tapered instruments is the lateral compression of bone. Consequently there were improvements in the quality and density of bone by condensing D3 bone to D2 and D4 bone to D3. Good success rate are observed when the implants placed with this procedure especially when there is deficit of bone width & height.

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